Lesson 14-13

Ka expresses the strength of an acid and Kb expresses the strength of a base which is shown in the previous lessons. In this lesson you will be show the relationship between Ka and Kb. Since strong acids are weak bases it would make sense that if Ka is high then Kb would be low. What a conjugate acid/base reaction is added up (reference pg. 570) the conjugate acid/base pairs cancel out of the reaction and you would be left with the equation for Kw. This gives us a reaction to figure Ka or Kb when one them is a given.

Ka x Kb =Kw

This equation can be manipulated in different ways.

Ka = Kw/Kb

Kb = Kw/Ka

Where Kw is always equal 1.0 x 10^-14

You may have notice that we are dealing with negative logarithms like with the pH scale. Likewise you can take the negative base 10 logarithms of both sides to obtain

pKa + pKb = pKw = 14.00

Lesson 14-15

This lesson talks about why one acid is stronger than another. The two most important factors affecting acid strength are the strength of the ***H-A bond*** and the electronegativity of ***A.*** Obviously the stronger the H-A bond the less likely that it is going to become a proton donor. As shown by the figure on page 577 the most important factor determining acidity is the H-A bond strength.

As far as periodic trends go, HA acid strength increases as electronegativity of A increases when going from left to right on the periodic table. The H-A acid strength increase as H-A bond strength decreases when when going from top to bottom. Examples are shown on page 578 using oxoacids.